IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

Ex Parte:	James L. Tracy
Application Number:	10/055,474
Filing Date:	September 21, 2001
Title:	ADAPTABLE KEYPAD AND BUTTON MECHANISM THERFOR
Group:	2673
Examiner:	JEFFREY J. PIZIALI

BRIEF ON BEHALF OF APPELLANTS UNDER 37 CFR 41.37

Scott M. Garrett
Attorney of Record

Motorola, Inc.
Intellectual Property Section
Law Department
8000 W. Sunrise Blvd
Plantation FL, 33322

Telephone: 954-723-6449
Facsimile: 954-723-3871

File Date: January 23, 2002

This appeal brief was first filed following a notice of appeal filed November 22, 2005, and is being refiled subsequent to a notice of non-compliant brief dated November 27, 2006.

CONTENTS

I. REAL PARTY IN INTEREST 3

II. RELATED APPEALS AND INTERFERENCES 3

III. STATUS OF CLAIMS 3

IV. STATUS OF AMENDMENTS 3

V. SUMMARY OF CLAIMED SUBJECT MATTER 4

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL 5

VII. ARGUMENT 6

VIII. CLAIMS APPENDIX 12

IX. EVIDENCE APPENDIX 17

IX. RELATED PROCEEDINGS APPENDIX 17

RECEIVED
CENTRAL FAX CENTER
MAR 27 2007

I. REAL PARTY IN INTEREST

The name of the real party in interest for purposes of this appeal is Motorola, Inc., a Delaware corporation.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals of interferences known to the Applicant, the Applicant's legal representative, or assignee which would directly affect or be directly affected by or having a bearing on the Board's decision in this pending appeal.

III. STATUS OF CLAIMS

Claims 1-23 are rejected.

Claims 8, 16, and 17 are rejected under 35 USC 112, first and second paragraphs.

Claims 1-4, 8-12, and 17-20 are rejected under 35 USC 102(b) over Di Santo et al (US 4,870,677).

Claims 5-7, 13-16, and 21-23 are rejected under 35 USC 103(a) over Di Santo in view of Dreher (US 4,551,717).

The rejections of claims 1-23 are hereby appealed.

IV. STATUS OF AMENDMENTS

Applicant first filed an amendment March 5, 2004 that did not amend the claims. Applicant then filed an amendment after final rejection July 19, 2004 which amended claims 1-3, 8-10, and 16. These amendments clarified the conductive traces of the invention. These amendments were not entered. Applicant then filed a RCE on October 19, 2004 making the

amendments of the July 19, 2004 amendment by preliminary amendment. On June 7, 2005 Applicant amended claims 8, 12, 14, and 16, and added new claims 17-23. Independent claims 8 and 16 were amended to add the limitation that the display means is flexible. New claims 17-23 are essentially duplicates of claims 1-7, but including the limitation that the display means is flexible.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In one embodiment a button mechanism is claimed including a switch means that operates or completes a button circuit when the button mechanism is actuated. Disposed in conjunction with the button mechanism is a display means which includes a driver layer which has a conductor element in the form of a symbol that is to be displayed on the button mechanism. An electrically active ink layer is disposed on the driver layer and covered by a transparent conductor layer. This and other embodiments are described in FIGs. 1 and 3, and at page 3, lines 27-31; page 4, lines 7-26; and page 7, lines 10-30.

In another embodiment an adaptable keypad is claimed which includes a plurality of keys, each key including a switch for operating a button circuit, and a flexible display including a driver layer having conductor elements in the form of symbols to be displayed located in correspondence with each of the plurality of keys, and an electrically active ink layer disposed between the driver layer and a transparent conductor layer. This and other embodiments are shown and described in FIGs. 1-3, and at page 3, lines 23-31; page 4, lines 7-26; page 5, line 30 to page 6, line 4; page 6 lines 22-34; and page 7, lines 10-30.

In another embodiment of the invention a portable electronic device having an adaptable keypad is claimed. The device is operable in a plurality of modes and includes a keypad having

a plurality of keys, each including a switch means and a flexible display means. The flexible display means includes a driver layer, a transparent conductor layer, and an electrically active ink layer disposed between the transparent conductor layer and driver layer. This and other embodiments are described in FIGs. 1-3, and at page 3, lines 23-31; page 4, lines 7-26; page 5, line 30 to page 6, line 4; and page 6 line 22 to page 7, line 30.

In another embodiment of the invention a button mechanism is claimed including a switch means that operates or completes a button circuit when the button mechanism is actuated. Disposed in conjunction with the button mechanism is a flexible display means which includes a driver layer which has a conductor element in the form of a symbol that is to be displayed on the button mechanism. An electrically active ink layer is disposed on the driver layer and covered by a transparent conductor layer. This and other embodiments are described in FIGs. 1 and 3, and at page 3, lines 27-31; page 4, lines 7-26; and page 7, lines 10-30.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 8, 16, and 17 are allowable under 35 USC 112, first and second paragraphs;

whether claims 1-4, 8-12, and 17-20 are allowable under 35 USC 102(b) over Di Santo et al (US 4,870,677); and

whether claims 5-7, 13-16, and 21-23 are allowable under 35 USC 103(a) over Di Santo in view of Dreher (US 4,551,717).

VII. ARGUMENT

With regard to claims 8, 16, and 17, and 35 USC 112 first paragraph:

independent claims 8, 16, and 17 were rejected for failing to comply with the written description requirement. Applicant amended claims 8 and 16 to add the limitation that the display means is flexible. Claim 17 was added during prosecution and contains the same limitation. Examiner contends that the specification does not support this limitation and that the specification only describes the driver layer as being flexible. The driver layer is an integral part of the display means.

On page 4, lines 13-16 recite: "[t]he assembly further includes a laminate for providing a ***display means*** comprised of a ***driver layer*** 108, an ***electrically active ink layer*** 110, and a ***transparent conductor layer*** 112."

Lines 16-20 continue, "The driver layer 108 is itself a laminate comprised of a ***flexible*** insulator layer made of, for example, Mylar or polyamide. On the ***flexible*** insulator layer there is disposed conductor elements 114, such as copper or conductive ink, for example."

These passages establish that the display means is a display laminate including flexible elements. Mylar and polyamide are notoriously well known in the art of flexible circuit boards.

On page 7, lines 30-31 recite, "[t]his ***display laminate*** is ***flexible***, allowing the popple dome to be depressed."

Thus, it is established that the display laminate is flexible, and provides that it is flexible enough to allow operation of a mechanical popple dome. As can be seen in FIG. 3, and as described at page 7, lines 25-28, the display means, comprised of a driver layer 306, electrically active ink layer 308, and driver layer 310, resides in correspondence with the popple dome 304. The popple dome must be depressed to contact a switch circuit 303, as described on the same page 7 at lines 20-25.

With regard to the conductor traces, which are described as part of the flexible display means, and therefore may not render the display means inflexible, it is well known to those skilled in the art of flexible circuit boards that conductor layers including conductor traces are flexible.

Accordingly, Applicant believes the instant specification fully describes the claimed limitation that the display means is flexible.

With regard to claims 8, 16, and 17, and 35 USC 112 second paragraph:

Independent claims 8, 16, and 17 were also rejected for being indefinite. In particular, the Examiner contended that the term "flexible" is not defined by the claim, and that the specification does not provide the requisite degree of flexibility necessary to practice the invention.

However, as pointed out with respect to the display means, the display means must be flexible *enough* to allow operation of a popple dome located in correspondence with the flexible display means, as recited at page 7, lines 20-25. Applicant had previously argued that the glass display of a cited reference was not flexible. Examiner contends that glass has some flexibility. However, glass will not be sufficiently flexible to allow operation of a popple dome, as shown in FIG. 3. One of ordinary skill in the art would not conceive of using glass in such an application, but would realize the degree of flexibility necessary would be found in materials such as mylar and polyamide which are commonly used in the fabrication of flexible circuit boards. Even if one were unaware as to the degree of flexibility needed, Applicant contends, given the materials described by Applicant, one would not be required to perform undue experimentation to design a display means flexible enough to operate the popple dome.

Accordingly, Applicant believes the instant specification fully enables the claimed limitation that the display means is flexible.

With regard to claims 1-4, 8-12, and 17-20:

Claims 1-4, 8-12, and 17-20 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Di Santo (U.S. Patent No.4,870,677).

Di Santo teaches a display 11 which may be used to display images of buttons as shown in FIGs. 2 and 3. The display uses, for example, a pressure sensitive overlay 12 to detect the location of pressure applied to the display system. The display uses a series of X and Y gridlines (col. 2, line 67 to col. 3, line 2). More detail is not provided in the description section of Di Santo, but the description does appear to refer to a the background section where it says "as indicated above" (col. 2, line 68). In the background section another patent by Di Santo (US

4,655,897), also having a X-Y arrangement, is recited. It appears this is the type of display used in the description of the invention. The description of the '897 patent display recites:

> "The patent discloses an electrophoretic display apparatus which includes a planar transparent member having disposed on a surface a plurality of vertical conductive lines to form *a grid of lines in the Y direction*. On top of the grid of vertical lines there is disposed *a plurality of horizontal lines which are positioned above the vertical lines* and insulated therefrom by a thin insulating layer at each of the intersection points. Spaced above the horizontal and vertical line pattern is *a conductive plate*. The space between the conductive plate and the X and Y line patterns is filled in with an electrophoretic dispersion containing chargeable pigment particles. When a voltage is impressed between the X and Y lines pigment particles, which are located in wells or depressions between the X and Y pattern, are caused to migrate towards the conductive plate and are deposited upon the conductive plate in accordance with the bias applied to the X and Y line conductors."

Thus, the display used in Di Santo uses three conductor layers to generate visually perceivable patterns in the electrophoretic material: an X grid of lines, a Y grid of lines, and a conductive plate. No differing description is offered elsewhere in Di Santo, and this summary has not been controverted in prosecution. To generates a pattern at a desired location, a "voltage is impressed between the X and Y pattern" causing particles to" migrate towards the conductive plate and are deposited on the conductive plate."

Applicant's claimed invention, as recited in all independent claims 1, 8, 16, and 17, uses only two conductor layers: a driver layer and a transparent conductor layer. The driver layer contains conductor elements in the shape of a symbol to be displayed. Examiner has contended that Di Santos X-Y grid lines are in the shape of a symbol to be displayed because they can be sued to display a period. However, this is incorrect comparison to Applicant's claimed limitation because to display a period, an X grid line and a Y grid line must be energized, and the shape is displayed only at their intersection. This requires two conductor layers, and the shape that is displayed is not in the shape of the conductors (grid lines), but is in the shape of their intersection. Therefore, Di Santo does not show Applicant's claimed limitation of "a driver layer having a conductor element configured in the form of a symbol to be displayed," as recited in claim 1 and similarly in claims 8, 16, and 17.

Claim 2 recites the limitation of first and second sets of conductors of the conductor element recited in claim 1, thus these sets of conductors are on the driver layer, as shown in FIG. 2 and described on page 5, line 30 to page 6, line 14. These sets of conductors for the symbol to be displayed. This allows two different symbols to be displayed at the location of the conductor sets. The Rejection contends this is equivalent to Di Santo's X-Y gridlines. However, as argued above, Di Santo's structure requires three conductor layers, Applicant's claimed structure is still only two layers. Furthermore, these conductor sets are still in the form of a symbol to be displayed, and not mere X-Y grid lines.

Claims 3 and 4 add to claim 2, and claim a third set of conductors that includes conductor elements common to both the first and second sets of conductor in claim 2. Claim 4 adds the limitation that the symbols are differently oriented. Again, with two conductor layers, not three as in Di Santo.

With regard to claim 8-11, 16, and 1-20, these claims contain similar limitations as in claims 1-4, but add that the display means is flexible. The flexibility of the display means has been discussed herein, supra, with respect to the rejections under 35 USC 112. The Rejection contends that the uncontroverted glass element of Di Santo is flexible, equivalent to Applicant's flexible display. However, the mere fact that glass may have *some* flexibility, given a sufficiently thin and sizeable area, does not make it equivalent to Applicant's flexible display, which must be flexible enough to operate a mechanical switch element such as a popple dome disposed in correspondence with the display, as claimed. Applicant contends that glass is not an equivalently flexible material, nor would one consider glass, given the dimensions recited in Di Santo (4 inches by 4 inches, col. 2, lines 63-65), to be "flexible" within an ordinary meaning of the word. Thus, as with claims 1-4, Applicant believes claims 8-11, 16, and 17-20 are distinguished from Di Santo, and are further distinguished by the added limitation of a flexible display.

With regard to claim 12, the limitation of first and second sets of symbols is added. Again, these sets occur on the driver layer 108, and shown in FIG. 1. They comprise a single conductor layer, unlike Di Santo which used an X grid layer and a Y grid layer.

With regard to claims 5-7, 13-16, and 21-23:

Claims 5-7, 13-16, and 21-23 were rejected under 35 USC 103(a) over Di Santo in view of Dreher (US 4,551,717).

All of the claims rejected in the section are dependent on independent claims Applicant regards as allowable in view of the arguments made with regard to the rejection under 35 USC 102(b). Thus Applicant believes Di Santo does not apply to these claims either.

However, with regard to claim 5, which recites that the switch means is a popple switch, Examiner refers to Dreher, FIG. 2, elements 11 and 12. Applicant points out that these elements are a key cap and a lens, as stated by Dreher at col. 2, lines 26-29. Dreher does not show a popple switch. Dreher does, however, recite that "any type of switch operable by the depression of a key can be used." However, Di Santo teaches away from using a switch means that requires depression to the degree of the key in Dreher or Applicant's popple switch because, as pointed out hereinabove, Di Santo's display uses glass substrate, and would not permit depression to actuate a sprung switch mechanism. Were one to use a sprung switch with the display of Di Santo, the display would break under the force of depression. Therefore Applicant believes one of ordinary skill in the art would not be motivated to combine Di Santo and Dreher.

Regarding claim 6, Examiner compared the lens of Dreher to Applicant's claimed transparent actuating member. However, while Applicant's transparent actuating member allows one to see what is displayed by the display means, it is more than a mere lens. It is the sole structure for actuating the switch. The key cap 11 of Dreher supports the lens 12, and it is the key cap that imparts force to the switch means. Dreher does not teach that the key cap is transparent.

Regarding claim 7, Examiner compared the lens 12 of Dreher to the convex outer surface of Applicant's transparent actuating member. However, claim 7 depends from claim 6, and as pointed out with regard to claim 6, the lens is not the actuating member.

With regard to claims 13-15, and claims 21-23, these claims correspond to claims 5-7, respectively. The distinctions drawn hereinabove apply to these claims as well. It is noted that claim 23, as presently pending, depends from claim 6. Should claims 7 and 23 be found allowable, Applicant intends to amend claim 23 to depend from claim 22.

With regard to claim 16, Applicant attempted to delete certain subject matter from the claim in an amendment filed June 7, 2005. Applicant inadvertently used single brackets to

indicate matter to be deleted, however, the rules regarding the manner of making amendments applicable at the time required either double brackets or strikethrough of the matter to be deleted. Examiner has required the single brackets and matter contained therebetween to appear in the claim in the following appendix. It is noted that in the Final Rejection of August 22, 2005, on page 9 of the Detailed Action, in comparing the claimed subject matter to the DiSanto reference, Examiner left out the bracketed material in reciting Applicant's claim limitation. Should claim 16 otherwise be found allowable, Applicant intends to delete the bracketed matter by proper amendment.

For the reason set forth above, Applicant respectfully submits that the Rejection of claims 1-23 has been obviated, and request that the Board withdraw the rejection.

Respectfully submitted,

James L. Tracy

by: _____

Scott M. Garrett
Attorney for Applicant
Registration No. 39,988
Phone: 954-723-6449
Fax: 954-723-3871

RECEIVED
CENTRAL FAX CENTER

MAR 2 7 2007

VIII. CLAIMS APPENDIX

1. A button mechanism, comprising:

a switch means for operating a button circuit in response to actuation of the button mechanism;

display means disposed in correspondence with the switch means and comprising:

a driver layer having a conductor element configured in the form of a symbol to be displayed on the button mechanism, and a conductive trace connected to the conductor element for providing voltage to the conductor element;

a transparent conductor layer; and

an electrically active ink layer disposed between the transparent conductor layer and the driver layer.

2. A button mechanism as defined in claim 1, wherein the conductor element comprises:

a first set of conductor elements corresponding to a first symbol, and connected to a first set of conductive traces; and

a second set of conductor elements corresponding to a second symbol and connected to a second set of conductive traces;

wherein the first and second symbols are coincidentally located.

3. A button mechanism as defined in claim 2, further comprising a third set of conductor elements which form segments common to both the first and second symbols, and are connected to a third set of conductive traces.

4. A button mechanism as defined in claim 2, wherein the first and second symbols are not commonly oriented.

5. A button mechanism as defined in claim 1, wherein the switch means comprises a popple switch.

6. A button mechanism as defined by claim 5, further comprising a transparent actuating member disposed in correspondence with the popple switch, such that the display means is between the popple switch and the transparent actuating member.

7. A button mechanism as defined in claim 6, wherein the transparent actuating member has a convex outer surface.

8. An adaptable keypad, comprising:

a plurality of keys, each of the plurality of keys comprising:

a switch means for operating a button circuit in response to actuation of the button mechanism;

a flexible display means disposed in correspondence with the switch means and comprising:

a driver layer having a conductor element in the form of a symbol to be displayed by the button mechanism, and a conductive trace connected to the conductor element for providing voltage to the conductor element;

a transparent conductor layer; and

an electrically active ink layer disposed between the transparent conductor layer and the driver layer.

9. An adaptable keypad as defined in claim 8, wherein the conductor element of each key comprises:

a first set of conductor elements corresponding to a first symbol, and connected to a first set of conductive traces; and

a second set of conductor elements corresponding to a second symbol and connected to a second set of conductive traces;

wherein the first and second symbols are coincidentally located.

10. An adaptable keypad as defined in claim 9, each key further comprising a third set of conductor elements which form segments common to both the first and second symbols, and are connected to a third set of conductive traces.

11. An adaptable keypad as defined in claim 9, wherein the first and second symbols are not commonly oriented.

12. An adaptable keypad as defined in claim 9, wherein the first set of conductor elements for each of the plurality of keys forms a first symbol set, the second set of conductor elements for each of the plurality of keys forms a second symbol set, the first and second symbol sets are exclusively energized depending on a mode of operating the keypad, wherein the keypad is usable in at least two modes, each mode requiring using a different orientation.

13. An adaptable keypad as defined in claim 8, wherein each of the switch means comprises a popple switch.

14. An adaptable keypad as defined by claim 13, further comprising a plurality of transparent actuating members, each of the transparent actuating members disposed in correspondence with each of the popple switches, such that the display means is between the popple switches and the transparent actuating members, and wherein each of the plurality of transparent actuating members is held in place by a housing.

15. An adaptable keypad as defined in claim 13, wherein each of the transparent actuating members has a convex outer surface.

16. A portable electronic device having an adaptable keypad, the portable electronic device operable in a plurality of modes, the portable electronic device comprising:

a keypad having a plurality of keys, each of the plurality of keys comprising:

a switch means for operating a button circuit corresponding to the switch means in response to [actuation of] the button mechanism being depressed;

a flexible display means disposed in correspondence with the switch means and comprising:

a driver layer having a first set of conductor elements corresponding to a first symbol and connected to a first set of conductive traces, and a second set of

conductor elements corresponding to a second symbol and connected to a second set of conductive traces, and wherein the first and second symbols are coincidentally located in correspondence with one of the plurality of keys;

a transparent conductor layer; [and]

an electrically active ink layer disposed between the transparent conductor layer and the driver layer[.]; and

a plurality of transparent actuating members, each of the transparent actuating members disposed in correspondence with one of the plurality of keys, and wherein each of the plurality of transparent actuating members is held in place by a housing of the portable electronic device.

17. A button mechanism for an electronic device, comprising:

a switch means for operating a button circuit in response to actuation of the button mechanism;

a flexible display means disposed in correspondence with the switch means and comprising:

a driver layer having a conductor element configured in the form of a symbol to be displayed at the button mechanism, and a conductive trace connected to the conductor element for providing voltage to the conductor element;

a transparent conductor layer; and

an electrically active ink layer disposed between the transparent conductor layer and the driver layer;

wherein the flexible display means allows depression of the switch means to complete the button circuit.

18. A button mechanism as defined in claim 17, wherein the conductor element comprises:

a first set of conductor elements corresponding to a first symbol, and connected to a first set of conductive traces; and

a second set of conductor elements corresponding to a second symbol and connected to a second set of conductive traces;

wherein the first and second symbols are coincidentally located, and wherein the first and second set of conductor elements and first and second set of conductive traces are all located on a single layer.

19. A button mechanism as defined in claim 18, further comprising a third set of conductor elements which form segments common to both the first and second symbols, and are connected to a third set of conductive traces.

20. A button mechanism as defined in claim 18, wherein the first and second symbols are not commonly oriented.

21. A button mechanism as defined in claim 17, wherein the switch means comprises a popple switch.

22. A button mechanism as defined by claim 21, further comprising a transparent actuating member disposed in correspondence with the popple switch, such that the display means is between the popple switch and the transparent actuating member.

23. A button mechanism as defined in claim 6, wherein the transparent actuating member has a convex outer surface.

IX. EVIDENCE APPENDIX

Applicant has cited US patent no. 4,655,897 to Di Santo, originally cited by Examiner in the Office Action mailed December 5, 2003 in connection with the present application.

X. RELATED PROCEEDINGS APPENDIX

No decisions have been rendered by a court of the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 C.F.R. § 41.37.